





Title:	<i>Standard operating procedure for the performance of Capillary Ear Lobe Blood Gases in Adults</i>
Area:	Acute Respiratory Unit, RSCH
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Purpose of the SOP:	To set standards for the sampling and measurement of capillary ear lobe blood gases at the point of care, for both inpatient care and outpatient clinics. This policy is for use in the adult population only
Scope:	The procedure must be followed by all healthcare professionals involved with CBG sampling for the monitoring of NIV therapy.
Reasons for blood gas analysis:	<ul style="list-style-type: none"> • To monitor the severity of respiratory failure, and its response to NIV therapy. • To assess ventilation and oxygenation status. • To assess acid base balance including biochemical values
Indications for blood gas analysis	<ul style="list-style-type: none"> • Patients with acute exacerbation of a chronic chest condition • Patients with impaired respiratory effort or an acute deterioration with established chronic respiratory failure • Patients with low SpO₂ at rest (below 93%). • Patients on NIV requiring monitoring. • To assess supplementary oxygen requirements for home oxygen.
Equipment:	<ul style="list-style-type: none"> • 1 x Capillary tube – (Plastic capillaries) • 1 x skin prep alcohol wipe • 1 x rubber bung • 1 x Safety Lancet Blade (Self-contained activated puncture 1.5mm (width) x 2mm (depth)) or Scalpel blade – Swan Morton No. 15 blade • Gauze swabs & Sterile Gauze swabs • Spot plaster • Paper towel. • Gloves • Plastic apron • Warm water or if available vasodilator cream • SpO₂ monitor • Sharps waste container • Nose clip

	<p>For outpatient monitor use iSTAT blood gas analyser. This will require the use of iSTAT cartridge (stored in the fridge).</p>
<p>Patient preparation and blood collection:</p>	<ul style="list-style-type: none"> • Ensure that the procedure is indicated and appropriate. • Confirm patient's name, date of birth and hospital number by asking the patient and checking details in the wrist band when available. • Explain the test procedure and why it is required. • Gain verbal consent to proceed. • Check if the patient is on anticoagulation therapy. If on warfarin or other anticoagulation, check INR/clotting. Caution should be taken if INR level is between 2.5-3.5. If routine sampling is requested for patients with an INR level >3.5 this needs to be clearly documented and authorised by requesting doctor • The patient should rest for 10-20 minutes prior to the test to get a true picture of baseline respiration. Ensure that the patient is comfortable and pain free. • Remove any earrings on the site of the procedure. • Wash hands in accordance with the trust hand washing policy and put disposable gloves and apron on. • Rub the ear-lobe with gauze and clean it with an alcohol wipe and let it dry. • Apply a gauze soaked in warm water (no more than 42°C) for 3-5 min prior to puncture. If available apply vasodilator cream to the ear lobe and leave for approximately 10 minutes. • Apply paper towel over the shoulder to protect patient's clothing in case of any spillage of blood • Attach the pulse oximeter to the patient and record SpO2 level. • Remove wet gauze, or vasodilator cream if used, from the ear-lobe rubbing vigorously with a gauze swab. • Hold the ear lobe firmly and support it by placing a rubber bung behind the lobe. Using the Safety Lancet Blade, activate the blade by pushing and pressing firmly. Ensure free and rapid blood flow. • Wipe away the first blood drop. Blood flow can be encouraged by rubbing the ear lobe but DO NOT SQUEEZE, as it will cause blood and tissue fluid to mix resulting in a lower pO2, pH and an increased pCO2

	<ul style="list-style-type: none"> • Collect the sample in the plastic capillary tube. Hold the tube horizontally, with one end of the tube placed into the drop, to allow capillary action. Ensure there are no air bubbles in the capillary tube. If an air bubble is present, gently tilt the tube until the bubble has been expelled. Air bubbles can falsely affect pO₂ and pCO₂ values. The sample should be discarded and repeated if the blood flow is slow or shows signs of clotting. • Cover the wound front and back with a piece of gauze and apply nose clip over the gauze to create haemostasis. • Dispose of all the sharps into the sharps waste containers, in accordance with trust policy. • Any other clinical waste to be disposed of in the clinical waste containers, in accordance with trust policy
Contraindications for the use of vasodilator cream:	<p>When NOT to apply vasodilator cream:</p> <ul style="list-style-type: none"> • The patient is taking anticoagulation medication such as warfarin, as vasodilator creams can increase the anti-clotting effects. • If the patient is allergic to salicylates (eg aspirin/ ibuprofen) or other non-steroidal anti-inflammatory medicines. • If the patient is allergic to any other ingredients in the vasodilator cream: <ul style="list-style-type: none"> ○ Ethyl nicotinate ○ Cetosteary ○ Polysorbate ○ Sorbitan monostearate ○ E128 – methyl parahydroxybenzoate ○ Perfume <p>Take special care if the patient is:</p> <ul style="list-style-type: none"> • Pregnant and breastfeeding • Has asthma
Analysing the sample: using GEM Premier 5000 blood gas	<ul style="list-style-type: none"> • Log on to the GEM 5000 blood gas analyser • On the main screen select “Micro Cap” • The sampler will extend facing forward at approximately 90° from its

<p>analyser</p> 	<p>home position</p> <ul style="list-style-type: none"> • Place the capillary tube over the end of the sampler, tilting it slightly upwards to avoid air bubbles in the capillary tube. • Select “start aspiration” button • Continue to hold the capillary device until aspiration is complete, the device will emit an audio/visual prompt when done. • Remove the capillary tube • Press “OK” for the sampler to retract and return to home position. • If the OK button is not pressed, it will retract itself within 15 seconds. • Introduce patient information using alphanumeric keypad or barcode scanner. • Patient information required before obtaining results are; <ul style="list-style-type: none"> ○ Patient ID or NHS number ○ Patient Last name ○ Patient First name ○ Patient date of birth • Press “print” to obtain a paper copy of the results. • Dispose of the capillary tubing in the sharps waste collection, in accordance with trust policy. • If, on entering patient ID, incorrect patient name or date of birth appear, notify the POCT team as soon as possible on: <ul style="list-style-type: none"> ○ uhsussex.poct@nhs.net ○ 01273 696955 extn. 65726/64109/65726 ○ Senior Specialist Biomedical Scientist: Jane Francis ○ Specialist Biomedical Scientist: Fadzai Fadaio
<p>Analysing the sample:</p> <p>using iSAT1 blood gas analyser</p> <div style="display: flex; justify-content: space-around;"> <div> <p>Analyser</p>  </div> <div> <p>printer</p>  </div> </div> <p>Cartridge:</p>  <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <p>Closure tab</p> <p>Sample well</p> </div>	<ul style="list-style-type: none"> • Press “power” button on the lower right hand side of the analyser to turn on • In the home screen select “perform patient test” • Follow analyser prompts: if you make a mistake press left arrow key to clear entry <ul style="list-style-type: none"> ○ Scan or manually enter your operator ID then press enter (you can bypass this by pressing “enter”) ○ Scan or manually insert patient ID ○ Scan the lot number of the cartridge pouch, aligning the red laser light to cover the entire barcode. A beep sound will be heard once done. ○ Select capillary sample type and press “next”. This screen will appear if more than one sample is required. • Remove cartridge from the pouch. • Place on a flat surface with the iSTAT writing facing upwards. • On the bottom right hand side corner (the sample well), place the capillary tube and ensure that blood is absorbed by capillary action, until reaching the blue arrow on the side. • On bottom left hand side corner there is a tab that folds closing the sample well. Press until it clicks. • Place the cartridge into the port at the end of the analyser, pushing the cartridge firmly. • The analyser will display “identifying cartridge” then a time-to-result bar will appear. Results will be shown in 2 to 3 minutes. • When the results are shown and audible sound will be heard and the

	<p>cartridge can be disposed of (this will silence the audio).</p> <ul style="list-style-type: none"> • Dispose of the capillary tubing in the sharps waste collection, in accordance with trust policy. • Connect printer to the i-STAT base via telephone cable to get a printer. • Press “print” to obtain a paper copy of the results.
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References and further reading:

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